REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1, 2, 4-6, 9-13, 17-22, 26-28, 30-32, 36-44 and 51-76 are pending in the present application. Claims 7, 8, 23-25, 29, 33-35 and 45-50 have been canceled, Claims 51-76 have been added and Claims 1, 13, 18, 19, 22, 40 and 42 have been amended by the present amendment.

In the outstanding Office Action, Claim 22 was rejected under 35 U.S.C. § 112, second paragraph; Claims 18, 31, 36-39 and 43 were rejected under 35 U.S.C. § 102(b) as anticipated by Logan et al.; Claims 1, 10, 12 and 44-49 were rejected under 35 U.S.C. § 103(a) as unpatentable over Logan et al.; Claims 2, 4-6, 9, 11, 17, 19, 23, 24, 28-30, 32 and 50 were rejected under 35 U.S.C. § 103(a) as unpatentable over Logan et al. in view of Edamura; Claims 20-22 were rejected under 35 U.S.C. § 103(a) as unpatentable over Logan et al. in view of Edamura and Ameen et al.; Claims 7 and 33 were rejected under 35 U.S.C. § 103(a) as unpatentable over Logan et al. in view of Edamura and Arasawa et al.; Claims 8, 13 and 40 were rejected under 35 U.S.C. § 103(a) as unpatentable over Logan et al. in view of Edamura and Fuji et al.; Claims 25, 34 and 35 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Logan et al.; Claims 26 and 27 were rejected under 35 U.S.C. § 103(a) as unpatentable over Logan et al. in view of Stegger et al.; Claim 41 was rejected under 35 U.S.C. § 103(a) as unpatentable over Logan et al. in view of Witaker et al.; and Claim 42 is rejected under 35 U.S.C. § 103(a) as unpatentable over Logan et al. in view of Randlett et al.

In the previous response filed November 4, 2002, arguments were presented that independent Claims 1, 18 and 19 include a feature in which the heater base is integrally formed of a ceramic material. Further, the heater base includes a mounting surface, a heater and a fluid passage provided in the heater base which is located below the heater. The heater

base is cooled by causing a fluid whose temperature is lower than a temperature of the heater base to be supplied to the fluid's passage. The independent claims have also been amended to recite that the fluid passage has a fluid inlet and fluid outlets formed in a lower surface of the heater base.

In a non-limiting example, Figures 1 and 2 show a ceramic heater system 1 including a heater base 2 formed of a ceramic material. The heater base 2 includes a mounting surface 2a and a heater 3 buried in the heater base 2 for heating an object such as a wafer W. Also included is a fluid passage 4 provided in the heater base 2 and being located below the heater 3. Further, the heater base 2 is cooled by causing a fluid whose temperature is lower than a temperature of the heater base 2 to be supplied to the fluid passage 4. The fluid passage 4 also includes a fluid inlet and fluid outlets formed in the lower surface of the heater base 2.

According to the system of the present invention, when the apparatus is stopped for maintenance or because of a problem, it is possible to cool the ceramic heater to room temperature in a short time. Therefore, the time required for maintenance is shortened, and the driving time of the apparatus is significantly improved. In addition, the time required to clean the apparatus (e.g., immediately after a film forming process) of the unnecessary film adhered to walls of the chamber, whose interior is kept in a vacuum state, can also be shortened.

Further, the present invention provides a ceramic heater system which has a high cooling efficiency while keeping the uniform heating performance on the heating surface higher (see page 4, lines 15-18).

Arguments were also presented in the previous response that the primary reference Logan et al. does not include a heater base integrally formed of a ceramic material which includes a mounting surface, a heater and a fluid passage as claimed. Rather, as shown in Figure 1 of Logan et al., the heater system includes a top insulating layer 42, an electrostatic

pattern layer 44, a heating layer 50 and a support 60. In this figure, the only components which are bonded to each other are the ceramic support 60 and the heat sink base 70 formed of iron/nickel/cobalt alloy (not a ceramic material).

In response to these arguments, the outstanding Office Action indicates that the features upon which Applicant relies (i.e., "the only components which are bonded to each other are the ceramic support 60 and the heat sink base 70") are not recited in the rejected claims (see item 14 at page 13 in the outstanding Office Action). However, Applicant notes the features noted by the outstanding Office Action are those of Logan et al. (i.e., the only components which are bonded to each other are the ceramic support 60 and the heat sink base 70) and are not the features upon which Applicant relies. Rather, the features upon which Applicant relies is that the heater base is integrally formed of a ceramic material including a fluid passage provided in the heater base below the heater.

As noted above, Logan et al. do not teach or suggest an entire heater base including a fluid passage being integrally formed of a ceramic material, because in Logan et al., the support 60 is disposed on top of the heat sink base 70, and the heat sink base 70 is formed of KOVAR (an iron/nickel/cobalt alloy). Thus, Logan et al. do not teach or suggest a heater base integrally formed of ceramic material.

Further, the outstanding Office Action indicates Logan et al. discloses an upper heater base 52 and a lower heater base 60 formed of a ceramic material in which the upper and lower heater bases form a one-body heater base and cites column 3, lines 34-60. However, there is no description in column 3, lines 34-60 concerning "forming a one-body heater base," and as shown in Figure 1, for example, separate heater bases are formed.

The outstanding Office Action also applies secondary references including Edamura, Ameen et al., Stegger et al., Arasawa et al., Fuji et al., Witaker et al. and Randlett et al. as disclosing features recited in the dependent claims.

However, Edamura discloses plasma etching using a microwave plasma etching apparatus. Generally, in plasma etching, a wafer is heated by plasma during the plasma processing. For this reason, the wafer is cooled to maintain a desirable temperature (generally between -10°C to room temperatures). Edamura discloses that the gas that accelerates cooling is introduced between the wafer and stage 3 to cool the stage. The cooled stage then cools the wafer so that the temperature of the wafer is maintained at a constant level. Because the purpose of the stage 3 is to cool the wafer, the stage 3 is formed of a metal. Edamura does not teach or suggest that the stage includes a ceramic material. Further, as noted above, the stage disclosed in Edamura is a plasma etching apparatus, which does not have a heating capability. The stage 3 shown in Figure 1 of Edamura is merely connected to a cooler whose purpose is to cool the wafer.

In addition, the purpose of the ceramic liner in Stegger et al. is to provide corrosion resistance, i.e. to protect the surface of the chamber wall that is formed of Al from halogen containing plasma. Stegger et al. do not teach or suggest that the wafer is heated. In re Lee indicates that claims cannot be rejected for lack of an inventive step based on general knowledge or common sense not taught, suggested, or given motivation for. It is necessary for teachings/suggestions/motivation to be clearly made in the specification. However, as stated above, Stegger et al. neither describes nor suggests that the wafer is heated.

Further, Witaker et al. disclose high power rotating anode X-ray tubes intended for use in medical radiograph (i.e., fluoroscopy and computerized tomography (CT)). Witaker et al. also do not teach or suggest heating the wafer nor the claimed heater base.

The other secondary references also do not teach or suggest the claimed invention (a heater base formed of a ceramic material as claimed).

Accordingly, it is respectfully submitted independent Claims 1, 18 and 19 and each of the claims depending therefrom are allowable.

In addition, Claim 22 has been amended in light of the rejection of this claim under 35 U.S.C. § 112, second paragraph.

Further, new Claims 51-76 have been added to set forth the invention in a varying scope, and Applicant submits the new claims are supported by the originally filed specification. In particular, new Claim 51 is similar to Claims 1, 24 and 27; new Claims 52-55 are similar to dependent Claims 4, 12, 41 and 42, respectively, except for their dependencies; new Claim 56 is similar to Claims 1 and 9; new Claims 57-64 are similar to dependent Claims 4, 12, 41, 42, 24, 26, 41, 43, respectively except for their dependencies; new Claims 65-69 are dependent Claims depending on Claims 1, 18, 19, 51 and 56, features of which are shown in Figure 8; new Claims 70-73 are methods of producing the heater bases in Claims 1, 18, 51 and 56, respectively; new Claim 74 is directed to a ceramic heater system; and new Claims 75 and 76 depend on Claims 9 and 36, respectively.

Regarding dependent Claims 75 and 76, it is respectfully noted that the heater and pattern 54 of Logan is formed of pyrolytic boron nitride, whereas the heating pattern of these claims is formed of a high-melting-point metal such as W, Mo or Pt.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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